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AUTHOR Hansen, Jacqueli ; Stansfield, Charles
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ABSTRACT

This paper explores the influence of field independent-dependent cognitive style on second language test performance, especially as it relates to performance on the integrative type of measure known as the cloze test. Approximately 250 college students enrolled in a first semester Spanish course formed the sample group for this correlational study. Students were administered the Group Embedded Figures Test of field dependence-independence along with several measures of linguistic, communicative, and integrative competence. The results showed student field independence to be related consistently in a positive albeit modest fashion to second language test performance. Most notable was the correlation between field independence and cloze test performance (r=.43, p. .001). The relationship was less marked on other measures such as final course grade (r=.21, p. .001). This suggests there may be a cognitive style bias operating in conjunction with cloze test performance. That is, such measures may call forth cognitive restructuring abilities more readily available to more field independent individuals. In turn, it implies the need to use some caution when employing or interpreting cloze tests for placement or achievement purposes. (Author)

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FIELD DEPENDENCE-INDEPENDENCE

AS A VARIABLE IN

SECOND LANGUAGE CLOZE TEST PERFORMANCE

Paper presented at the Sixteenth International Conference of Teachers of English to Speakers of Other Language, Honolulu, Hawaii, May 1, 1982.

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by

Jacqueline Hansen

Boulder Valley Public Schools

Boulder, Colorado

and

Charles Stansfield

Educational Testing Service

Princeton, New Jersey

FL 012 909

INTRODUCTION

During the past decade scholars in the field of second language testing have directed an increasing amount of attention to the cloze test procedure as a measure of general second language proficiency. A verbal cloze test presents the reader with a prose passage which has had words deleted systematically from the text. The reader must then fill in the blanks with the appropriate words. Research studies have shown the cloze test to correlate rather well with other measures of second language proficiency. This suggests that it is a valid and reliable procedure. However, since its first application to the L2 learner (Carroll, et al., 1959), there has been considerable uncertainty about exactly which language skills and cognitive processes are tapped in cloze test performance. As a result there is continued controversy about the validity of this procedure as a test of general L2 proficiency (Alderson, 1979). The basic question remains, is success on a cloze test solely a function of second language proficiency, or do other non-linguistic factors influence the ability to fill in the blanks appropriately? In this paper we will explore the influence of one non-linguistic factor, field dependent-independent cognitive style (FD/I), on L2 cloze test performance by presenting further analyses of data collected during a study which is described elsewhere (Hansen and Stansfield, 1981, 1982).

BACKGROUND

As mentioned above, the verbal cloze test presents the reader with a prose passage in which words have been systematically eliminated from the text. The deletions usually occur at every fifth to tenth word while the first and last sentences of the passage are generally left intact. The

reader must then fill in the blanks with the appropriate words to complete the text. Scoring of the insertions varies since credit can be given for the exact word only, for synonyms, or for any semantically acceptable word choice.

The procedure was pioneered by Taylor (1953) who experimented with it as a measure of contextual redundancy. Taylor derived the name from the concept of closure in Gestalt psychology. Gestaltists believe that learning follows a sequence through which one first understands the whole, or broader issues, and then grasps the individual details. Similarly, the cloze procedure requires the student to perceive the whole, by filling in the missing words, as if they were not missing at all (Stansfield, 1980).

Since Taylor's initial work, the cloze test has been used for a variety of purposes. In particular, it is recognized as a reliable and valid measure of reading comprehension and text readability for native speakers of English (Alderson, 1979; Readance et al., 1980). When applied to non-native speakers, it is viewed by many as a valid and reliable measure of general second language proficiency (Bialystok and Howard, 1979; Aitken, 1977; Oller, 1976). Proponents of the test suggest that it is an integrative test of global skills in the second language (Oller, 1976). As such it measures overall or general proficiency to a greater degree than do more traditional discrete-point tests of vocabulary and grammar. At present the cloze test is used as a testing device on standardized second language proficiency measures, such as the Secondary level English Proficiency Test, and on foreign language classroom tests at all levels.

Research on the cloze procedure in the L2 setting has basically focused on the correlation between cloze test performance and scores on other types of second language tests such as dictation and reading

comprehension tests, and on standardized proficiency measures like the Test of English as a Foreign Language (TOEFL). In a review of the literature Aitken (1977) reported that the majority of studies show that cloze performance correlates well with other measures of L2 proficiency. For example, in an early study, Darnell (1968) obtained a correlation of .84 between cloze performance and scores on the TOEFL. Oller (1972) found correlations of .75 and .83 between the cloze and the UCLA English as a Second Language Placement Exam. Canadian researchers report correlations ranging from .52 to .70 between cloze data and second language achievement. (Swain, Lapkin and Barik, 1976; Lapkin and Swain, 1977). Given these fairly high and consistent correlations, proponents of the cloze procedure have argued that it offers an easily constructed, reliable, and valid test of general L2 proficiency.

Yet some researchers in the field of second language testing urge caution before embracing those assumptions until more is known about the validity of this procedure to measure L2 proficiency. For instance, Alderson (1979) reports that the utility of cloze tests as actual measures of second language skill varies widely. He shows that performance differs as a function of text difficulty, scoring procedures, and word deletion frequency. It is his view that as those factors vary, the cloze measures different abilities. Thus its reliability and validity vary from one situation to another.

One point of confusion arises from the fact that we have little understanding of the way or degree to which cloze testing actually taps or reflects second language processing. This dilemma is true even in respect to the well established use of the cloze test as an indicator of

reading comprehension for native speakers (Readance et al., 1980; Bormuth, 1969; Weaver, 1965). Bialystok and Howard (1979, p. 27) recognize this problem in the area of L2 testing also:

> However, in spite of the sample demonstration of cloze test reliability as given by the correlations with numerous other proficiency measures, the precise skills measured by the cloze test and the problem-solving processes which they presuppose have not been specified.

Oller and Conrad (1971) acknowledge this deficiency but pose the question: "Is it necessary to know exactly what a test is a test of in order to make use of it?" (p. 187). They proceed to respond to that question in the negative. Nevertheless, most psychologists and specialists in educational measurement would affirm the need to establish the construct validity of any test. Construct validity in language testing must necessarily be based on a theory of language processing that bears a relationship to the processes called forth on the test. Psycholinguists suggest that both receptive and productive language processing involves a strategy of sampling, predicting, testing, and confirming meaning based on one's internalized language system (Goodman, 1971; Aitken, 1977). Similar processes appear to be called forth in solving a cloze task.

Theoretically, in a cloze test a person needs to employ a large number of the interrelated skills that comprise a language system (e.g., lexical, grammatical, contextual) in order to predict accurately what word most appropriately fits into each empty space. This prediction is said to take place through an hypothesis-testing strategy based on one's internalized language competence. According to Oller (1973) the taker of

an L2 cloze test infers or projects an acceptable word on the basis of a whole or complete message. As one notices the details and samples from the information available while trying to fill in the spaces, one formulates hypotheses about the information expected to follow. By further sampling of subsequent information, the original hypotheses are confirmed or challenged. If they are repudiated, one revises the first expectations, restructuring information to form a new hypothesis. For the second language learner, the accuracy of this strategy on a cloze test or a dictation reflects the degree of underlying, internalized second language competence.

Bialytsok and Howard (1979), concerned with identifying the actual processes involved in solving verbal cloze tasks, investigated the skill of inferencing as a factor in cloze performance. They defined inferencing as the ability to exploit maximally all available information sources in order to arrive at new insights into unknown aspects of the second language. They hypothesized that if inferencing were involved in cloze solutions, then factors that facilitated inferencing should enhance performance on a cloze test. In their study, cues and instructions to facilitate the use of inferencing behavior did result in improved cloze test performance. They concluded that inferencing was an integral component in performance on cloze tests.

THE PROBLEM

As outlined above, inferencing has been identified as an integral, nonlinguistic factor in L2 cloze test performance. Interestingly, the psychological literature describes the cognitive style construct of field dependence-independence as a cognitive factor that affects

hypothesis-testing, inferencing, and restructuring behavior on various problem-solving tasks (Goodenough, 1976; Witkin, Moore, Goodenough, and Cox, 1977). Thus, field dependence-independence might also be a non-linguistic factor that influences L2 cloze test performance.

Field dependence-independence refers to individual differences in preferred ways of perceiving, organizing, analyzing, or recalling information and experience. Field dependence indicates a tendency to rely on external frames of reference in cognitive activities and is thought to foster skill in interpersonal relations, whereas field independence suggests reliance on internal rules or strategies for processing information and the existence of mental restructuring abilities (Witkin and Goodenough, 1977).

Witkin, Moore, Goodenough, and Cox (1977) explain that persons with a well articulated, field-independent cognitive style are apt to analyze actively the elements of a perceptual field when it is organized and to impose structure on a field which lacks an inherent organization. Field-independent persons are likely to employ such mediational processes or strategies as analyzing, structuring, hypothesis-testing, and inferencing to generate solutions to problems. They appear to experience the details of a "field" as separate elements and they can alter that field or context when necessary to accomplish the task. Moreover, they behave as though governed by general internalized principles which they have actively abstracted from their experiences. In contrast, field-dependent persons make less use of these mediational strategies in information processing. They are likely to use the "field" as they find it, to make less use of surrounding information, and to have more difficulty analyzing that information to solve a particular problem (Readance et al., 1980). In other words, they are not likely to exploit

maximally all information sources. This exploitation of information sources is the definition of inferencing behavior offered earlier. However, it is possible to train field-dependent persons to utilize an analytical, hypothesis-testing approach in appropriate situations (Witkin et al., 1977).

If the L2 cloze test is conceived as a task which asks the test-taker to infer or predict the appropriate word in order to fill the gap through an hypothesis-testing strategy, it could be related to the cognitive restructuring abilities fostered by a field-independent cognitive style. As a result, the test may be making cognitive demands which allow the field-independent person to fill in the blanks more easily or accurately regardless of second language proficiency. Field-dependent persons, on the other hand, may be at a disadvantage when taking this type of test, since they aren't as likely to utilize the strategies helpful to the solution of L2 cloze problems. In that event a cognitive style bias would be operating in cloze performance. . . a bias which would lessen the validity of this instrument as a test of general second language proficiency.

In an attempt to address the issue of possible cognitive style bias in the cloze procedure, this paper compares the achievement patterns of foreign language students on a variety of Spanish proficiency measures, including the cloze test, in order to ascertain the relationship between performance on the different tests and the degree of field dependence-independence.

METHOD

Subjects. The subjects for the study were 293 college students in an introductory Spanish course at the University of Colorado. The 16-week course emphasized both linguistic and communicative competence through large group

lectures (two hours per weeek), small group recitation classes (three hours per week), language laboratory sessions, and textbook-workbook excercises.

Instrumentation. The students' degree of field dependence-independence was determined by the Group Embedded Figures Test (GEFT). The GEFT (Oltman, Raskin, and Witkin, 1971) is a group administered test which requires the subject to outline a simple geometric shape within a complex design. The subject must locate or separate the relevant information from the contextual field and restructure it to design the correct shape. In theory, this task discriminates the extent to which the person perceives analytically and is able to identify the relevant information within the organized field.

Foreign language proficiency was assessed in terms of three areas of competence: linguistic, communicative, and integrative.[1] Linguistic competence was defined as the ability to use basic structural units of Spanish. This was tested by each student's Written Exam Grade Average, derived from scores on six unit tests designed to assess mastery of grammar; and by scores on the Final Exam, a comprehensive discrete-point achievement test similar to the unit tests in format. Communicative competence, defined as the ability to give and receive oral messages in Spanish, was assessed by each student's Oral Grade Average, obtained from performance on oral tests of communicative ability given throughout the semester; and by teacher ratings on an Oral Skill Evaluation questionnaire. Integrative competence, interpreted as general language proficiency or a combined linguistic and communicative competence was measured via each students' Final Course Grade and Cloze Test score.

Procedures. Toward the end of the semester the GEFT was administered to all the students who were present at a large-group lecture session.

Everyone was urged to participate in the test, though a few students chose to study instead. No effort was made to coerce those students or to test anyone who was absent. As a result, GEFT scores were obtained for 253 students. American College Test (ACT) English and Math scores were recorded for a subset of 102 students on whom such data was available in the university Admissions Office. The course instructors provided the Oral Skill Evaluation for each student as well as the various exam and course grades. The Cloze Test was given at the time of the Final Exam.

Data Analysis Procedures. A correlational design was chosen to analyze the relationship between student FD/I and Spanish achievement. The initial procedure involved obtaining Hoyt reliability data on the GEFT (.90) and the Cloze Test (.75). Pearson product-moment correlations were then established between the several variables, correcting for attenuation wherever possible. For a subgroup of 102 students correlations were next obtained between academic aptitude, Spanish achievement, and FD/I. In a further step academic aptitude was removed from the correlations by a first-order partial correlation technique.

RESULTS AND DISCUSSION

The correlations between the various measures of Spanish language proficiency ranged from .60 to .93. They are presented in Table 1. These findings indicate that a substantial relationship exists between several diverse types of language tests. This suggests that the various instruments are measuring overlapping language skills or a general aspect of language competence. It should be noted, however, that the categories were generally lowest between the Cloze test and the other measures, ranging from .60 to .80. While these correlations are rather strong, the amount of shared

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Insert Table 1 about here

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variance between the Cloze Test and the other measures of language competence is slightly less than the amount of variance those measures share with each other. Thus the Cloze Test appears to be tapping some ability that is not incorporated into the other measures as completely as it is into the Cloze.

The correlations between GEFT score and the measures of Spanish proficiency were all positive, but modest. Since a higher GEFT score indicates a greater degree of field independence, the positive nature of these correlations shows that a field-independent cognitive style is associated with a higher level of achievement on all measures of second language proficiency. For traditional measures, such as course grades and discrete-point grammar tests, the correlations with FD/I ranged from .20 to .28. Yet the correlation between FD/I and Cloze Test score rose to .43, a notable difference.

When discussing the relation of cognitive style to scholastic achievement, academic aptitude should be held constant. Although the evidence reveals that FD/I is a factor in cognition separate from general intelligence (Vernon, 1972), there is some overlap with both verbal and quantitative aptitude (Witkin, Moore, Oltman, Fiedman, and Owen, 1977). In this study, these constructs were assessed for a subgroup of students via A.C.T. English and Math scores. The correlation for verbal and quantative aptitude with FD/I was .32 and .48 respectively, as shown in Table 2. The

correlations between academic aptitude and Spanish proficiency were in the .16 to .46 range. Verbal aptitude showed a somewhat stronger and more

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Insert Table 2 about here.

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consistent relationship to second language achievement than did mathematical aptitude, except on the Cloze Test. In that instance, A.C.T. Math score correlated .46 with the cloze measure while A.C.T. English scores exhibited a correlation of .39. Thus the more positive relationship was demonstrated between quantitative aptitude and cloze performance.

It is noteworthy that GEFT and Cloze Test scores show a nearly identical pattern of correlation with A.C.T. scores and that both are more related to quantitative ability than to verbal aptitude. In addition, they both correlate more highly with mathematical aptitude than do the other Spanish achievement tests. Apparently the GEFT and the Cloze Test are tapping the same aptitude construct to a greater degree than are the other instruments.

In order to disambiguate the overlapping relationships between academic aptitude, Spanish proficiency, and field dependent-independent cognitive style, the stronger of the two aptitude measures, the ACT Math score, was removed from the correlation through a partial correlation procedure. That analysis is presented in Table 3. The effect of removing quantitative

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Insert Table 3

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ability from the correlations between GEFT and the traditional measures of Spanish proficiency is to reduce the relationships to a non-significant level ($r = .07$ to $.15$). This is to be expected, since when we partial out aptitude it should be impossible to predict achievement. However, L2 Cloze Test scores continue to correlate significantly with FD/I ($r = .22$, $p < .05$) when aptitude is removed. This suggests that Cloze Test performance is influenced to a greater degree by field independent cognitive style than are traditional measures of Spanish proficiency.

Since the correlations between GEFT and the Cloze Test are much higher than those between GEFT and the other measures of Spanish proficiency, it seems that a cognitive style bias may be operational in cloze solutions. That is, the evidence indicates that field independent individuals do indeed fill in the blanks on a Cloze Test more easily than do field dependent persons. Their FI cognitive restructuring abilities are more conducive to success on a cloze reconstruction task. Based on this data, it appears that general second language proficiency and academic aptitude do not fully explain L2 Cloze Test performance. The cloze incorporates a non-linguistic, cognitive style factor as well. It is noteworthy that Carroll, Carton and Wilds (1959, p. 116) obtained similar findings in an initial investigation of the cloze done for the College Entrance Examination Board. After comparing the cloze with other measures they concluded that it is "affected by various sources of extraneous variance," including certain intellectual traits. Further research into the actual cognitive processes involved in solving L2 cloze tests may lend insights into how field independence influences performance on cloze reconstruction tasks.

Table 1

Correlations Between Six Measures of Spanish Proficiency and Student Field Independence

	Written Exam Grade Average	Final Exam	Oral Grade Average	Oral Skill Evaluation	Final Course Grade	Cloze Test
Final Exam						
Oral Grade Average	.70	.67				
Oral Skill Evaluation	.70	.70	.76			
Final Course Grade	.93	.88	.76	.73		
Cloze Test	.68	.80	.60	.64	.69	
GEFT[1]	.24	.28	.20	.21	.21	.43

$p < .001$ in all instances.

[1]A higher GEFT score indicates a relatively greater degree of field independence.

Table 2

Academic Aptitude Correlations with Six Measures of Spanish Proficiency and Field Independence

	ACT--English	ACT--Math	n
Written Exam Grade Average	.36***	.36***	102
Final Exam	.34***	.36***	102
Oral Grade Average	.35***	.25**	95
Oral Skill Evaluation	.31***	.16*	102
Final Course Grade	.34***	.22*	102
Cloze Test	.39***	.46***	90
GEFT	.32***	.48***	102

*p < .05
**p < .01
***p <.001

Table 3

Correlations Between Measures of Spanish Proficiency and Field Independence, Partialling Out Academic Aptitude (ACT Math Score)

	GEFT	n
Written Exam Grade Average	.07	102
Final Exam	.13	102
Oral Grade Average	.08	95
Oral Skill Evaluation	.15	102
Final Course Grade	.12	102
Cloze Test	.22*	90

*p <.05

NOTES

[1]Since the context of this study is a first semester foreign language course, we will use the terms achievement and proficiency interchangeably. For a detailed explanation of this usage of terminology see Stansfield (1981).

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